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REPORT OF VITAMIN D ASSAYS

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REPORT OF VITAMIN D ASSAYS

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Since 1932, the Maryland Feed Control Service has been requiring the registration of all products sold in Maryland as vitamin D supplements for poultry and livestock feeding. These products include cod liver oils, "fortified" cod liver oils, sardine oils, and certain types of dry concentrated feed mixtures carrying especially large quantities of vitamin D. Each brand has been licensed under a definite guarantee of vitamin D potency, and samples of the various products gathered by official inspectors of this Department have been assayed periodically to determine whether or not the products were of the vitamin D potency claimed. In a summarized report of tests carried out during the years 1932 through 1936 published by this Department in May 1937, it was shown that out of 97 tests of products representing 20 different firms, 90 met the guarantee and 7 were not of the potency claimed (in two cases out of the 7 deficiencies the samples were only slightly less potent than guaranteed).

During the period covered by these tests the potency of a product was evaluated in terms of the percentage necessary to produce a definite response in the calcification of chicks when tested by a definite procedure. This procedure is known as the A. O. A. C. method of assay for vitamin D, the technique having been adopted as a tentative method by the Association of Official Agricultural Chemists.

It was realized early in this period that some expression of potency in terms of units of vitamin D per gram would be preferable to the statement of the percentage of the material which must be fed according to a specific technique to give a certain response. As a consequence, studies of the problem of translating bone ash response of chicks into units were initiated and, through the use of the U. S. P. reference cod liver oil, a suitable chick unit was finally devised. This unit, which has been named the A. O. A. C. chick unit, is based on the increased bone ash percentages produced when increasing unitages of vitamin D from the U. S. P. reference oil is fed to chicks. The A. O. A. C. chick unit can be defined as that quantity of vitamin D which will produce a response equal to that produced by one unit of vitamin D from the U. S. P. reference cod liver oil when assayed by the Association of Official Agricultural Chemists' method.

In the fall of 1936 the A. O. A. C. method was revised so as to provide for the use of positive control pens of chicks fed definite quantities of vitamin D from a reference cod liver oil. With the bone ash figures from these control pens as a standard of response, the unitage of a test oil is ascertained by feeding it at a suitable level or levels and comparing the response noted to that of the positive control pens. Following this revision of the A. O. A. C. method, the Maryland Feed Control Service, as well as the regulatory agencies of other States carrying on vitamin D tests changed the registration requirements in 1937 to provide for a potency guarantee in terms of A. O. A. C. chick units per gram.

Work was immediately started in our laboratories designed to ascertain the response we could expect from definite unitages of vitamin D, and the degree of accuracy with which it would be possible for us to estimate the potency of test oils. This work is still in progress. Several facts have so far been established which are of interest and importance to the success of our work. Among the foremost of these is that evidently the response of chicks in our laboratories to vitamin D is somewhat greater than that observed in most laboratories. Another fact brought out is that there are apparently a large number of cod liver oils sold for poultry feeding which will not meet 85 A. O. A. C. chick units of vitamin D per gram. This unitage is the minimum potency allowable for cod liver oil according to the standards set for cod liver oil by the U. S. Food and Drug Administration.

Due to the serious effect which the reports of assays by regulatory laboratories can have on the industry, we are making no public report of our results pending completion of tests now in progress (tests of a confirmatory nature). Such reports will be available during the forthcoming year, the first possibly early in 1938 unless complications arise in our present studies which have not been indicated so far.